

Anesthetic Management in Cardiac Surgery During Pregnancy: A 16-year Clinical Study of 138 Patients

He Jing, Wenting Pang, Liting Yang, Peirong Lin, Jiexian Liang, Jiakai Lu, Sheng Wang

Background

- Since 2010, we have treated 138 patients with cardiac surgery during pregnancy.
- Due to dual effects of physiological changes by pregnancy and pathological changes by heart disease, cardiac surgery during pregnancy has higher risk for both mothers and fetuses or neonates.



Objective

Cardiac surgery during pregnancy represents the highest-risk clinical scenario with high maternal and fetal mortality.

This retrospective study summarizes our 16-year experience in perioperative anesthetic management and maternal-fetal outcomes.



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Study Design and Methods



Study Type & Period

Retrospective Clinical Study (2010 - 2025)



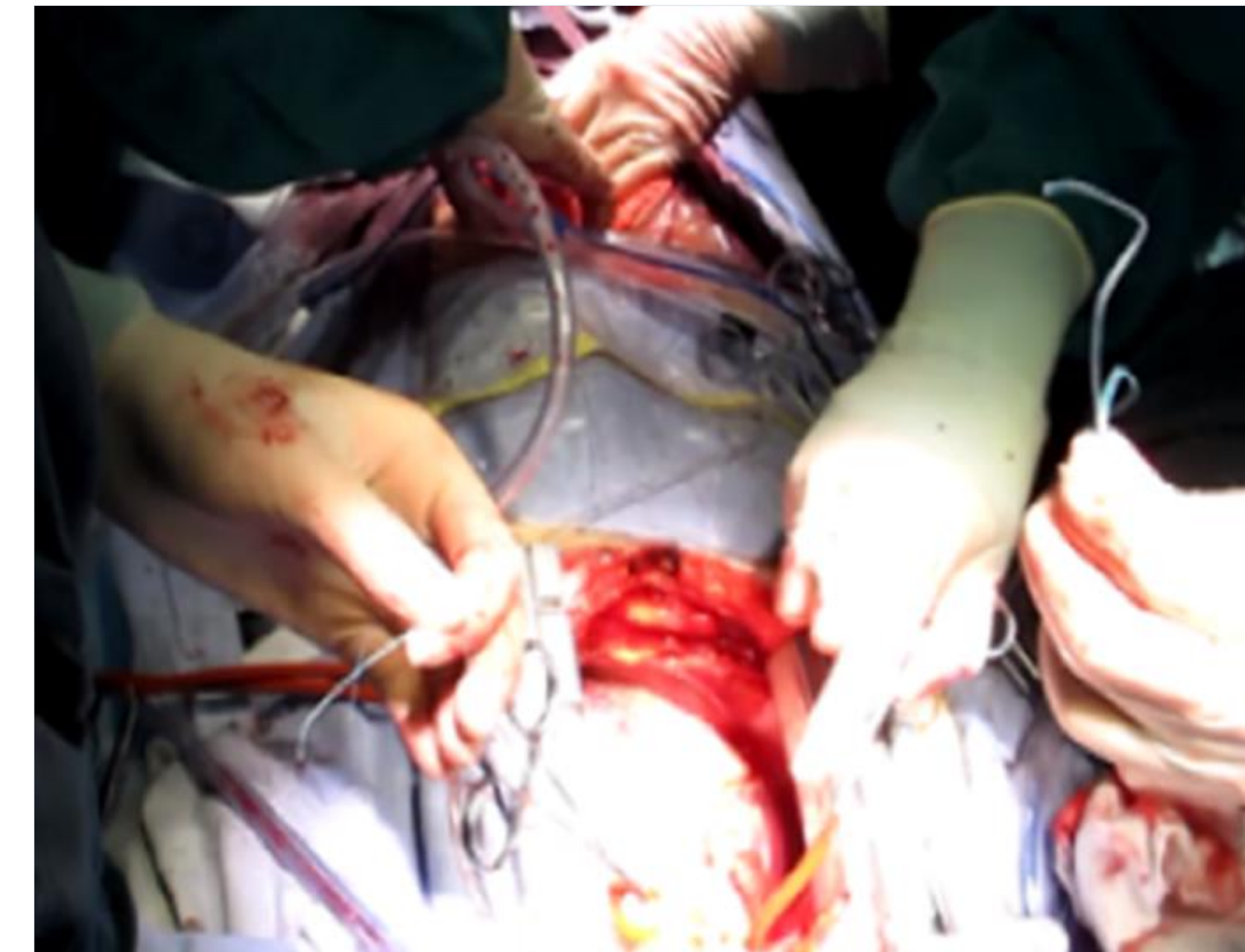
Data Source

**Two Major National Cardiovascular
Centers China**



Study Population

**138 Patients Undergoing Cardiac Surgery
During Pregnancy**



Patient Grouping Strategy

Group A : Cardiac surgery with fetus in situ

Group B : CS prior to cardiac surgery

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Results

Table 1. Key patient and intraoperative characteristics

Variables	Overall (n=138)	Cardiac surgery with foetus in situ (n=82)	CS prior to cardiac surgery (n=56)	P-value
Preoperative characteristics				
Aneurysm or dissection, n (%)	49 (35.5)	14 (17.0)	35 (62.5)	P<0.001
Regurgitation/stenosis valve or thrombosis prosthetic valve, n (%)	39 (28.3)	32 (39.0)	7 (12.5)	P<0.05
Previous cardiac surgery, n (%)	22 (15.9)	18 (22.0)	4 (7.1)	P<0.05
NYHA III- IV, n (%)	45 (32.6)	25 (30.5)	20 (35.7)	P<0.05
Time from presentation to surgery, median (IQR),days	19 (2-96)	58 (17-120)	4 (1-49)	P<0.05
Emergency surgery, n (%)	61(44.2)	18(22.0)	43(76.8)	P<0.05
Intraoperative TEE, n (%)	89(64.5)	52(63.4)	37(66.1)	P>0.05
Advanced hemodynamic monitoring with cardiac output measurement (FloTrac or pulmonary artery catheter), n (%)	58(42.0)	33(40.2)	25(44.6)	P>0.05
Continuous fetal heart rate monitoring, n (%)	51(37.0)	51(62.2)	0	P<0.001
Autologous blood transfusion, n (%)	138(100.0)	82(100.0)	56(100.0)	P>0.05
Massive transfusion (>10 units of red blood cells), n (%)	5(3.6)	1(2.4)	4(7.1)	P<0.05
Peak intraoperative VIS, median (IQR),mg.kg ⁻¹ .min ⁻¹	5(3-8)	5(3-7)	5(3-8)	P>0.05
Immediate extubation in the operating room, n (%)	17(12.3)	13(15.9)	4(7.1)	P<0.05
Multimodal regional analgesia, n (%)	22(15.9)	5(6.1)	17(30.4)	P<0.05
Duration of postoperative mechanical ventilation, median (IQR), hours	21(11-38)	18(5-22)	27(14-63)	P>0.05
Postoperative ICU length of stay, median (IQR), days	3 (2-6)	1(1-3)	3 (2-5)	P<0.05

Table 2. Maternal outcomes

Variables	Overall (n=138)	Cardiac surgery with foetus in situ (n=82)	CS prior to cardiac surgery (n=56)	P-value
Overall maternal cardiac events, n (%)	17(12.3)	8(9.7)	9(16.1)	P<0.05
Death, n (%)	4(2.9)	1(1.2)	3(5.4)	P<0.05
Heart failure, n (%)	5(3.6)	2(2.4)	3(5.4)	P>0.05
Arrhythmia, n (%)	5(3.6)	4(4.8)	1(1.8)	P<0.05
Heart failure and Arrhythmia, n (%)	3(2.2)	1(1.2)	2(3.6)	P>0.05

Table 3. Maternal and foetal mortality in different patient groups

	Trimester of cardiac surgery				
	Overall	First	Second	Third	P-value
Maternal mortality					
Overall (n= 138)	4/ 138(2.9)	0/ 7	1/ 73(1.4)	3/ 58(5.2)	0.07
Cardiac surgery with foetus in situ (n=82)	1/ 82(1.2)	0/ 7	0/70	1/ 5(20)	0.15
CS prior to cardiac surgery (n=56)	3/56 (5.3)		1/3 (33.3)	2/53 (3.8)	< 0.001
Foetal mortality					
Overall (n=138)	33/ 138(23.9)	5/ 7(71.4)	22/ 73(30.1)	6/ 58(10.3)	< 0.001
Cardiac surgery with foetus in situ (n=82)	28/ 82(34.1)	5/ 7(71.4)	21/70 (30.0)	2/ 5(40.0)	0.24
CS prior to cardiac surgery (n=56)	5/56 (8.9)		1/3 (33.3)	4/53 (7.5)	0.006



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Discussion

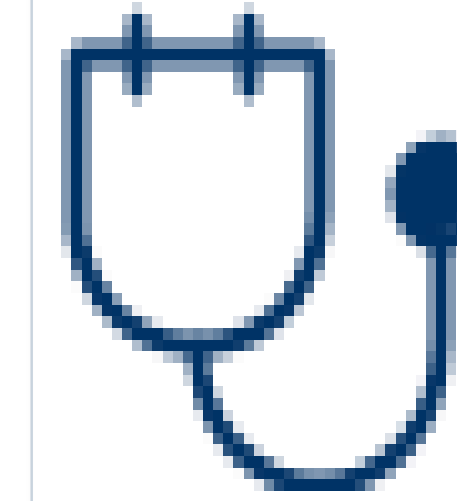
This study confirms: the crucial role of aggressive anesthetic management strategies in improving outcomes for patients undergoing cardiac surgery during pregnancy.

Strategy discussion: Preoperative cesarean delivery may be an important strategy to improve fetal outcomes but requires individualized assessment.

Future directions: Future prospective studies are needed to further optimize management protocols.

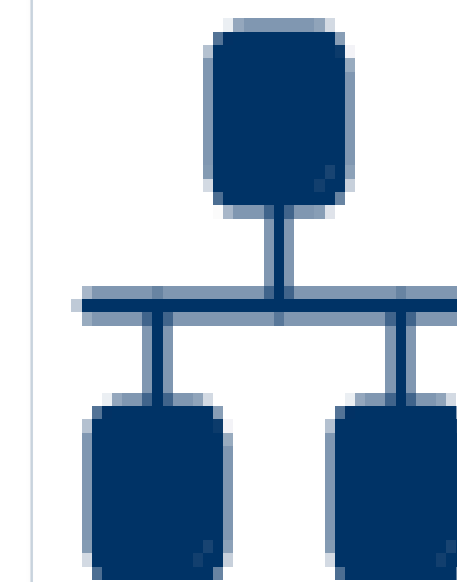
Conclusion

Maternal and fetal safety during cardiac surgery in pregnancy is highly dependent on precise, anesthesia-centered perioperative management.



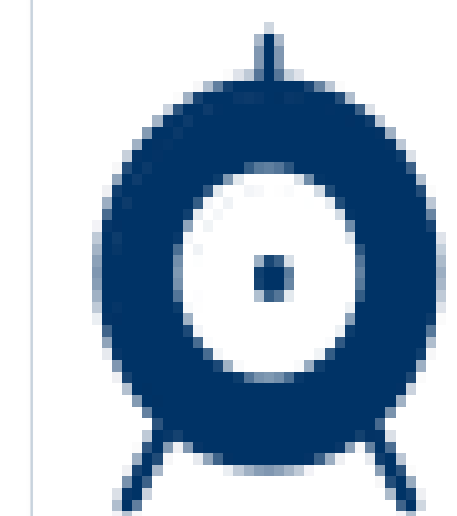
Comprehensive Preoperative Evaluation

Including multidisciplinary discussion and risk stratification.



Central Coordinator for Intraoperative Resuscitation

The anesthesiologist is expected to coordinate the multidisciplinary team towards unified goals.



Goal-Directed Interventions

Implement comprehensive monitoring, precise blood management, vasoactive drug administration, and enhanced recovery principles.